CLAIMS

1. A method of processing information representing a source signal conveying content intended for human perception, the method comprising:

receiving first spectral components that were generated by application of an analysis filterbank to the source signal, wherein the first spectral components represent spectral content of the source signal expressed in a first subspace of a multidimensional space;

deriving one or more first intermediate components from at least some of the first spectral components, wherein at least some of the first intermediate components differ from the first spectral components from which they are derived;

forming a combination of the one or more first intermediate components according to at least a portion of one or more impulse responses to obtain one or more second intermediate components;

deriving one or more second spectral components from the one or more second intermediate components, wherein the second spectral components represent spectral content of the source signal expressed in a second subspace of the multidimensional space that includes a portion of the multidimensional space not included in the first subspace;

obtaining estimated measures of magnitude or phase using the first spectral components and the second spectral components; and

applying an adaptive process to the first spectral components to generate processed information, wherein the adaptive process is responsive to the estimated measures of magnitude or phase.

2. The method of claim 1, wherein:

the first spectral components are transform coefficients arranged in one or more blocks of transform coefficients that were generated by application of one or more transforms to one or more segments of the source signal; and

the portions of the one or more impulse responses are based on frequency response characteristics of the one or more transforms.

3. The method of claim 2, wherein the frequency response characteristics of the one or more transforms are dependent on characteristics of one or more analysis window functions that were applied with the one or more transforms to the one or more segments of the source signal.

4. The method of claim 3, wherein at least some of the one or more transforms implement an analysis filter bank that generates the first spectral components with time-domain aliasing.

5. The method of claim 3, wherein at least some of the one or more transforms generate first spectral components having real values expressed in the first subspace, and wherein the second spectral values have imaginary values expressed in the second subspace.

6. The method of claim 5, wherein the transforms that generate first spectral components having real values expressed in the first subspace are Discrete Cosine Transforms or Modified Discrete Cosine Transforms.

7. The method of claim 1, wherein:

the first spectral components are transform coefficients arranged in one or more blocks of transform coefficients that were generated by application of one or more transforms to one or more segments of the source signal,

the one or more second intermediate components are obtained by combining the one or more first intermediate components according to a portion of the one or more impulse responses, each of the one or more impulse responses comprise a respective set of elements arranged in order, and

the portion of each of the one or more impulse responses excludes every other element in the respective set of elements.

8. The method according to claim 1 that further comprises obtaining estimated measures of magnitude or phase using one or more third spectral components that are derived from at least some of the one or more first spectral components.

9. The method according to claim 8, wherein:

the first spectral components are transform coefficients arranged in one or more blocks of transform coefficients that were generated by application of one or more transforms to one or more segments of the source signal;

the third spectral components are derived from a combination of two or more of the first spectral components; and

the estimated measures of magnitude or phase for a respective segment of the source signal are obtained adaptively using either the third spectral components or using the first and second spectral components.

10. The method according to claim 8, wherein:

the first spectral components are transform coefficients arranged in one or more blocks of transform coefficients that were generated by application of one or more transforms to one or more segments of the source signal;

the third spectral components are derived from a combination of two or more of the first spectral components; and

the estimated measures of magnitude or phase for at least some spectral content of a respective segment of the source signal are obtained using the third spectral components and the estimated measures of magnitude or phase for at least some of the spectral content of the respective segment of the source signal are obtained using the first and second spectral components.

11. The method according to claim 8 or 10 that comprises obtaining measures of magnitude or phase adaptively using either the third spectral components or using the first and second spectral components.

12. The method of claim 1 that comprises adapting the portion of the one or more impulse responses in response to a measure of spectral component significance.

13. The method of claim 12, wherein the measure of spectral component significance is provided by a perceptual model that assesses perceptual significance of the spectral content of the source signal.

14. The method of claim 12, wherein the measure of spectral component significance reflects isolation in frequency of one or more spectral components.

15. The method of claim 1, wherein:

the first spectral components are first transform coefficients arranged in one or more blocks that were generated by application of one or more transforms to one or more segments of the source signal, a respective block having a first number of first transform coefficients;

the second spectral components are second transform coefficients;

a second number of second transform coefficients are derived that represent spectral content that is also represented by some of the first transform coefficients in the respective block; and

the second number is less than the first number.

16. The method according to claim 1, 2, 9, 10 or 12 that comprises:

applying the adaptive process to the first spectral components to generate synthesized spectral components;

deriving one or more third intermediate components from the first spectral components and/or the second spectral components and from the synthesized spectral components; and

generating one or more output signals conveying content intended for human perception by applying one or more synthesis filterbanks to the one or more third intermediate components.

17. The method according to claim 16, wherein at least some of the synthesized spectral components are generated by spectral component regeneration.

18. The method according to claim 16, wherein at least some of the synthesized spectral components are generated by decomposition of first spectral components and/or second spectral components representing a composite of spectral content for a plurality of source signals.

19. The method according to claim 16, wherein at least some of the synthesized spectral components are generated by combining first spectral components and/or second spectral components to provide a composite representation of spectral content for a plurality of source signals.

20. The method according to claim 1, 2, 9, 10 or 12 that comprises:

generating the first spectral components by applying the analysis filter bank to the source signal;

applying the adaptive process to the first spectral component to generate encoded information representing at least some of the first spectral components; and

generating an output signal conveying the encoded information.

21. A medium conveying a program of instructions that is executable by a device to perform a method of processing information representing a source signal conveying content intended for human perception, the method comprising:

receiving first spectral components that were generated by application of an analysis filterbank to the source signal, wherein the first spectral components represent spectral content of the source signal expressed in a first subspace of a multidimensional space;

deriving one or more first intermediate components from at least some of the first spectral components, wherein at least some of the first intermediate components differ from the first spectral components from which they are derived;

forming a combination of the one or more first intermediate components according to at least a portion of one or more impulse responses to obtain one or more second intermediate components;

deriving one or more second spectral components from the one or more second intermediate components, wherein the second spectral components represent spectral content of the source signal expressed in a second subspace of the multidimensional space that includes a portion of the multidimensional space not included in the first subspace;

obtaining estimated measures of magnitude or phase using the first spectral components and the second spectral components; and

applying an adaptive process to the first spectral components to generate processed information, wherein the adaptive process is responsive to the estimated measures of magnitude or phase.

22. The medium of claim 21, wherein:

the first spectral components are transform coefficients arranged in one or more blocks of transform coefficients that were generated by application of one or more transforms to one or more segments of the source signal; and

the portions of the one or more impulse responses are based on frequency response characteristics of the one or more transforms, which are dependent on characteristics of one or more analysis window functions that were applied with the one or more transforms to the one or more segments of the source signal.

23. The medium according to claim 21, wherein the method further comprises obtaining estimated measures of magnitude or phase using one or more third spectral components that are derived from at least some of the one or more first spectral components.

24. The medium according to claim 23, wherein:

the first spectral components are transform coefficients arranged in one or more blocks of transform coefficients that were generated by application of one or more transforms to one or more segments of the source signal;

the third spectral components are derived from a combination of two or more of the first spectral components; and

the estimated measures of magnitude or phase for a respective segment of the source signal are obtained adaptively using either the third spectral components or using the first and second spectral components.

25. The medium according to claim 23, wherein:

the first spectral components are transform coefficients arranged in one or more blocks of transform coefficients that were generated by application of one or more transforms to one or more segments of the source signal;

the third spectral components are derived from a combination of two or more of the first spectral components; and

the estimated measures of magnitude or phase for at least some spectral content of a respective segment of the source signal are obtained using the third spectral components and the estimated measures of magnitude or phase for at least some of the spectral content of the respective segment of the source signal are obtained using the first and second spectral components.

26. The medium according to claim 23, wherein the method comprises obtaining measures of magnitude or phase adaptively using either the third spectral components or using the first and second spectral components.

27. The medium of claim 21, wherein the method comprises adapting the portion of the one or more impulse responses in response to a measure of spectral component significance.

28. The medium of claim 27, wherein the measure of spectral component significance is provided by a perceptual model that assesses perceptual significance of the spectral content of the source signal.

29. The medium of claim 27, wherein the measure of spectral component significance reflects isolation in frequency of one or more spectral components.

30. The medium of claim 21, wherein:

the first spectral components are first transform coefficients arranged in one or more blocks that were generated by application of one or more transforms to one or more segments of the source signal, a respective block having a first number of first transform coefficients;

the second spectral components are second transform coefficients;

a second number of second transform coefficients are derived that represent spectral content that is also represented by some of the first transform coefficients in the respective block; and

the second number is less than the first number.

31. The medium according to claim 21, wherein the method comprises:

applying the adaptive process to the first spectral components to generate synthesized spectral components;

deriving one or more third intermediate components from the first spectral components and/or the second spectral components and from the synthesized spectral components; and

generating one or more output signals conveying content intended for human perception by applying one or more synthesis filterbanks to the one or more third intermediate components.

32. The medium according to claim 21, wherein the method comprises:

generating the first spectral components by applying the analysis filter bank to the source signal;

applying the adaptive process to the first spectral component to generate encoded information representing at least some of the first spectral components; and

generating an output signal conveying the encoded information.

33. An apparatus for processing information representing a source signal conveying content intended for human perception, the apparatus comprising:

means for receiving first spectral components that were generated by application of an analysis filterbank to the source signal, wherein the first spectral components represent spectral content of the source signal expressed in a first subspace of a multidimensional space;

means for deriving one or more first intermediate components from at least some of the first spectral components, wherein at least some of the first intermediate components differ from the first spectral components from which they are derived;

means for forming a combination of the one or more first intermediate components according to at least a portion of one or more impulse responses to obtain one or more second intermediate components;

means for deriving one or more second spectral components from the one or more second intermediate components, wherein the second spectral components represent spectral content of the source signal expressed in a second subspace of the multidimensional space that includes a portion of the multidimensional space not included in the first subspace;

means for obtaining estimated measures of magnitude or phase using the first spectral components and the second spectral components; and

means for applying an adaptive process to the first spectral components to generate processed information, wherein the adaptive process is responsive to the estimated measures of magnitude or phase.

34. The apparatus of claim 33, wherein:

the first spectral components are transform coefficients arranged in one or more blocks of transform coefficients that were generated by application of one or more transforms to one or more segments of the source signal; and

the portions of the one or more impulse responses are based on frequency response characteristics of the one or more transforms, which are dependent on characteristics of one or more analysis window functions that were applied with the one or more transforms to the one or more segments of the source signal.

35. The apparatus according to claim 33 that further comprises means for obtaining estimated measures of magnitude or phase using one or more third spectral components that are derived from at least some of the one or more first spectral components.

36. The apparatus according to claim 35 wherein:

the first spectral components are transform coefficients arranged in one or more blocks of transform coefficients that were generated by application of one or more transforms to one or more segments of the source signal;

the third spectral components are derived from a combination of two or more of the first spectral components; and

the estimated measures of magnitude or phase for a respective segment of the source signal are obtained adaptively using either the third spectral components or using the first and second spectral components.

37. The apparatus according to claim 35, wherein:

the first spectral components are transform coefficients arranged in one or more blocks of transform coefficients that were generated by application of one or more transforms to one or more segments of the source signal;

the third spectral components are derived from a combination of two or more of the first spectral components; and

the estimated measures of magnitude or phase for at least some spectral content of a respective segment of the source signal are obtained using the third spectral components and the estimated measures of magnitude or phase for at least some of the spectral content of the respective segment of the source signal are obtained using the first and second spectral components.

38. The apparatus according to claim 35 that comprises means for obtaining measures of magnitude or phase adaptively using either the third spectral components or using the first and second spectral components.

39. The apparatus of claim 33 that comprises means for adapting the portion of the one or more impulse responses in response to a measure of spectral component significance.

40. The apparatus of claim 39, wherein the measure of spectral component significance is provided by a perceptual model that assesses perceptual significance of the spectral content of the source signal.

41. The apparatus of claim 39, wherein the measure of spectral component significance reflects isolation in frequency of one or more spectral components.

42. The apparatus of claim 33, wherein:

the first spectral components are first transform coefficients arranged in one or more blocks that were generated by application of one or more transforms to one or more segments of the source signal, a respective block having a first number of first transform coefficients;

the second spectral components are second transform coefficients;

a second number of second transform coefficients are derived that represent spectral content that is also represented by some of the first transform coefficients in the respective block; and

the second number is less than the first number.

43. The apparatus according to claim 33 that comprises:

means for applying the adaptive process to the first spectral components to generate synthesized spectral components;

means for deriving one or more third intermediate components from the first spectral components and/or the second spectral components and from the synthesized spectral components; and

means for generating one or more output signals conveying content intended for human perception by applying one or more synthesis filterbanks to the one or more third intermediate components.

44. The apparatus according to claim 33 that comprises:

means for generating the first spectral components by applying the analysis filter bank to the source signal;

means for applying the adaptive process to the first spectral component to generate encoded information representing at least some of the first spectral components; and

means for generating an output signal conveying the encoded information.